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EXAMINER	
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ART UNIT	PAPER NUMBER
3663	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/661,847	BOARDMAN ET AL.	
	Examiner	Art Unit	
	Daniel L. Greene Jr.	3663	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 February 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8,10,11,13 and 15-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,10,11,13 and 15-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11/16/04 & 2/1/06* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) for the reasons set forth in section 4 of the previous Office action mailed 9/1/2005.

Although the Examiner approved the amendment to Figure 4 adding reference 164 in the Office Action dated 12/23/2004 at page 2, upon further review of applicant's amendment to the drawings and specification it is apparent that an objection is indeed proper for the reasons set forth in section 4 of said previous Office action mailed 9/1/2005. Any inconvenience to applicant is regretted.

Upon further consideration it is noted that the 11/16/2004 addition of indicia 164 to Figure 4 and corresponding amendment to the specification does NOT actually disclose any protrusions. Page 10 of applicant's remarks received 11/16/2004 submit that one skilled in the art after reading the specification in light of the figures would understand the steps described in the specification referring to mating grooves or protrusions into core support beams as recited in paragraph 0026, however after careful review of the figures and said paragraph 0026 it is not clear how and in what manner such is so. For example, said paragraph discloses mating grooves or protrusions are machined into the core support beams, however no such example is set forth. It is not seen wherein the specification **as filed** sets forth how many mating grooves or how many protrusions are required to perform the function set forth in the claims, whether

the protrusions are a result of machining the mating grooves, whether the protrusions are continuous or not, etc. Although one skilled in the art may know how to machine grooves, it is not seen how the specification **as filed** teaches one skilled in the art to machine grooves, including how many (just one, or several, where, size, shape, etc. in applicant's instant invention in order to provide an operative embodiment.

Upon further review of figures 2-4 and 6 it is appears that there is NO WAY the invention could function as claimed because Figure 3 clearly shows that where two support beams intersect the core plate extends (Fig 6. (140)). It does NOT appear that two immediately adjacent/adjoining plates would be able to cover the SAME intersection of support beams because said extension (140) is covering said intersection of said beams and would appear to interfere with the same extension from said immediately adjacent/adjoining plates.

2. The drawings are objected to under 37 CFR 1.83(a) for the following reason(s) as well as those reasons set forth in sections 5a AND 5b of the previous Office action mailed 9/1/2005.

a. The drawings must show every feature of the invention specified in the claims. Therefore, each removable support plate with one groove sized to engage the entire portion of one of the plurality of support beams such that the entire beam is positioned in said groove must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Applicant amended the claim language of claims 1 and 13 to include the preceding interpretation because "each said removable support plate" comprises "at least one groove", "sized to engage...one of said support beams where at least a portion of said beam is positioned in said groove" (Underlining added). The limitation "at least a portion" is understood to encompass something as small as "a portion" but as large as the entire beam because the claim does not specify an upper limit to the limitation "at least a portion".

See MPEP 2111.01, which states

> While the claims of issued patents are interpreted in light of the specification, prosecution history, prior art and other claims, this is not the mode of claim interpretation to be applied during examination. During examination, the claims **must be interpreted as broadly as their terms reasonably allow**. In re American Academy of Science Tech Center, F.3d, 2004 WL 1067528 (Fed. Cir. May 13, 2004)

With regards to the objections to the drawings set forth in the previous Office action mailed 9/1/2005, Applicant's arguments filed 2/1/2006 have been fully considered but they are not persuasive.

b. Applicant's 2/1/2006 remarks, amendment to Figure 2 and the addition of Figure 8 appear to indicate that the support beams are comprised of **only one** protrusion (164) that extends the full length of the support beam.

> "Applicants submit that reference character 150 is used to designate a support beam and reference character 164 is used to designate a protrusion that extends from the top of the beam 150. Applicants submit that the Examiner approved the amendment to Figure 4 adding reference character 164 in the Office Action dated December 23, 2004, at page 2.

> Also, Applicants submit herewith a new Figure 8, for approval, that better illustrates the protrusion 164 extending from the top of beam 150."

Further, a thorough review of the specification as filed does not appear to indicate only one protrusion along the length of a support beam because paragraph 26 of said originally filed specification discloses;

> "In one embodiment, core support beams 150 have mating grooves or protrusions (not shown) machined into the core support beams 150 after the core support beam structure has been welded together and heat treated. Protrusions extend along a length of a core support beam 150 and are receivable within matching grooves 122, 124, 126 and 129 of core support plate 100" (Underlining added)

It must also be noted that the limitations "groove" and "protrusion" do NOT connote any one particular geometry per se. Interpreted broadly the limitation "protrusions" reads on two or more studs machined into or welded onto the support beam such as in U.S. Patent 4,127,445 to Anthony.

c. Applicant's remarks concerning indicia 164 have been addressed in section 1 above. Note that applicant argues "a protrusion extending along the length of support beam 150" while paragraph 0026, as filed, discloses "Protrusions extend along the length of support beam 150" (underlining added). Further the addition of label 164 is still considered new matter for said reasons set forth in said section 5b of said office action mailed 9/1/2005.

Again, although the Examiner approved the amendment to Figure 4 adding reference 164 in the Office Action dated 12/23/2004 at page 2, upon further review of applicant's amendment to the drawings and specification it is apparent that an objection is indeed proper for the reasons set forth in section 4

of said previous Office action mailed 9/1/2005. Any inconvenience to applicant is regretted.

Specification

3. The amendments filed 11/16/2004 and 2/1/2006 are objected to under 35 U.S.C. 132(a) because they introduce new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows:

Applicant's arguments filed 2/1/2006 have been fully considered but they are not persuasive. Accordingly the objection from section 6 of the previous Office action mailed 9/1/2005 is maintained and incorporated herein by reference.

a. "protrusions 164". In the specification as filed, paragraph 0026 originally stated "mating grooves or protrusions (not shown) machined into the core support beams". Applicant's 11/16/2004 amendment introduced new matter by adding indicia 164 to Figure 4 and reference to same in the specification. See the discussion of this topic in sections 1 and 2 above.

b. The addition of Figure 8 and the reference to Figure 8 added into the specification, "best shown in Figure 8". In the specification as filed, paragraph 0026 originally stated "mating grooves or protrusions (not shown) machined into the core support beams". Figure 8 was added with Applicant's 2/1/2006

amendment, which introduced the new matter. Again the specification itself as originally filed specifically stated that the mating grooves or protrusions were NOT SHOWN. Applicant cannot properly add information that was not originally within a disclosure as filed. There is no support in the application as originally filed for figure 8 to indicate what it does. There is no basis for the shape of protrusion 164, the depth of groove 122, the spacing between beam 150 and support plate 100, etc. See the discussion of this topic in sections 1 and 2 above.

Applicant is required to cancel ALL the new matter in the reply to this Office Action.

Claim Objections

4. Claims 1 and 13 are objected to because of the following informalities: Applicant's amendments to the claims introduced a misspelling of the word "least" such that the amendment as filed claims "support beams where at east a portion..." (underlining added to show misspelling). Appropriate correction is required, however for examination purposes it is understood that the word "least" will be used in place of the word "east" in said claims 1 and 13.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

5. Claim 5 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention for the reasons set forth in section 7 of the previous office action mailed 9/1/2005.

Applicant's own admission in the specification as filed, paragraph 0026, lines 3-6 state that the specification fails to disclose how and in what manner the support beams comprise a protrusion extending along a length thereof, because the protrusions are not shown. See the discussion of this topic in sections 1-3 above.

Further, it is noted that Applicant argues "a protrusion extending along **THE** length of the support beam" when the claim language is "comprises a protrusion...along **A** length of said beam".

6. Claims 1-8, 10, 11, 13 and 15-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement for the reasons set forth in section 8 of the previous office action mailed 9/1/2005. The claim(s)

contains subject matter, which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Applicant's arguments filed 2/1/2006 have been fully considered but they are not persuasive with respect to section 8a (claims 1 and 13) and 8c (Claim 5) of said previous Office action mailed 9/1/2005. See the discussion of these topics in sections 1-3 above.

The rejection of sections 8b and 9b of said previous Office action mailed 9/1/2005 is withdrawn due to applicant's amendment to claim 4.

7. Claims 1-8, 10, 11, 13 and 15-20 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

a. Applicant's 2/1/2006 amendment to the claim language of claims 1 and 13 include "each said removable support plate" comprises "at least one groove", "sized to engage...one of said support beams where at least a portion of said beam is positioned in said groove" (Underlining added). The limitation "at least a portion" is understood to encompass something as small as "a portion" but as large as the entire beam because the entire beam is AT LEAST a portion of said beam because it is the entire beam.

See MPEP 2111.01, which states

> While the claims of issued patents are interpreted in light of the specification, prosecution history, prior art and other claims, this is not the

> mode of claim interpretation to be applied during examination. During examination, the claims **must be interpreted as broadly as their terms reasonably allow**. In re American Academy of Science Tech Center, F.3d, 2004 WL 1067528 (Fed. Cir. May 13, 2004)

Claims 1 and 13 are vague, indefinite and incomplete in what all is meant by and encompassed by the phrase "at least one groove in said bottom surfaces each said groove sized to engage one of said support beams where at east (sic) a portion of said beam is positioned in said groove" (underlining added). The claim does not recite any positive limitations on the terms "sized to engage", including how and in what manner such is accomplished, whether this refers to the use of the actual grooves, whether there is any play in the "engagement" or whether it is a tight/secure fit, whether a support plate with a groove in the bottom surface engages a support beam without the use of a protrusion, i.e., wherein the "portion" of said beam is only a portion of its length and not the portion that is a "protrusion". The claims do not recite whether the groove extends the whole length of the support beam or support plate, or only extends part length, etc., hence the metes and bounds of the claim are undefined. See the discussion of this topic in sections 1-3 above.

b. Claim 5 is vague, indefinite and incomplete in what all is meant by and encompassed by the phrase " a protrusion extending...along a length of said beam" for the reasons set forth in sections 1-3 above. Again, the limitation "protrusion" does NOT connote any particular geometric structure, per se and simply stating "one skilled in the art would understand what is meant by a

protrusion extending along the length of the support beam and that the protrusion is receivable within the at least one groove" without any supporting evidence or rationale is unpersuasive. Accordingly the metes and bounds of the claim are undefined.

c. There is no proper antecedent basis for all terms present. See for example "said removable support plate" in claims 1,6,7 and 13, "said core" in claim 4, etc.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. **Claims 1-6, 13 and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 4,127,445 to Anthony for the reasons set forth in section 10 of the previous office action mailed 9/1/2005 which refers to the reasons set forth in section 16 of the previous office action mailed 12/23/2004 which are further explained in section 8 of said previous office action mailed 12/23/2004, reproduced here for applicant's benefit.**

a. Section 16 of the previous office action mailed 12/23/2004

Anthony clearly discloses an apparatus for supporting fuel assemblies (16) in a reactor pressure vessel (12) including a core (14) comprising a plurality of support beams (19 and 21) and at least one removable support plate (54) disposed on said plurality of support beams (19 and 21), each said removable support plate (54) comprising at least one groove (4 grooves labeled (62)) configured to mate with one of said plurality of support beams (via beam/protrusion combination 19, 21, 22, and 23), wherein said at least one removable support plate (54) and said plurality of support beams (19 and 21) form a core support (18) comprising a support ring (29) having an inner periphery and an outer periphery, said plurality of support beams (19 and 21) extending between said inner periphery, and said plurality of support beams (19 and 21) intersecting one another to form a support beam matrix wherein said at least one removable support plate (54) is configured to be removed from above the core and each of said plurality of support beams (19 and 21) comprise a protrusion (the combination of 22 and 23) extending along a length thereof (see figure 2), said protrusion (the combination of 22 and 23) receivable within said at least one groove (62) (See Figures 3 - 6) wherein said at least one removable support plate (54) comprising at least one support plate flow passage (in Figures 1-6, and column 2 lines 67+, column 3 lines 1-7, and 50+, column 4 lines 26-45 and column 6 lines 35-45 and column 7.

b. **Applicant continues to argue that the support plates do not contact the support beams. This is not persuasive because as previously explained in**

section 8 the 12/23/2004 Office Action, reproduced here below for applicant's benefit.

Section 8 of said previous office action mailed 12/23/2004

With regard to the 102 Rejection of claims 1-6 and 13-15, applicant argues that Anthony (U.S. Patent 4,127,445) does not describe nor suggest an apparatus for supporting fuel assemblies as recited in Claim 1. More specifically, Anthony does not describe nor suggest an apparatus having a removable support plate including at least one groove configured to mate with a support beam. Rather, in contrast to the present invention, Anthony describes a support structure having a plurality of support beams, metal pads, and alignment pins, wherein fuel assemblies are supported and aligned by the pads and pins. Specifically, alignment posts extend downward from a lower end plate of the fuel assemblies and a bottom surface of the alignment posts rest on a top surface of the pads. Accordingly, for the reasons set forth above, Applicants submit that Claim 1 is patentable over Anthony.

This is not persuasive because Anthony clearly discloses all of the limitations of claims 1-6 and 13-15 as detailed in the Office Action mailed 9/16/2004. Wherein it is understood that the "protrusion" or "pads and pins" are integral with and part of the plurality of support beams and as admitted by applicant, the alignment posts (i.e. grooves), which are integral with and part of the support plate (which is removable), are therefore configured to contact and mate with one of said plurality of support beams.

Applicant argues that Anthony discloses fuel assemblies supported and aligned by alignment pins and that the lower end plate (54) is integral to the fuel assembly, however said plates are removable from the core and the fuel assembly support plates and perform and disclose all the functions of applicant's invention. Therefore applicant's argument is not persuasive and the previous rejection stands and by reference is incorporated herein.

With respect to arguments directed to claims 13-15, applicant is again reminded that the "support plate (54)" is clearly removable from both the fuel assembly AND the reactor core, and said support plate (54) does comprise "at least one grove (62) configured to mate with one of the plurality of support beams (the combination of 19, 21, 22, and 23)" as previously described in the aforementioned office action.

c. Section 10 of the previous office action mailed 9/1/2005

It is noted that the support plates are indirectly mating with the support beams and in any event applicant's claim language does not preclude indirect contact, i.e. contact with a pin or pad, because the claim does not specifically disclose the support plate and support beam is in direct contact, therefore it is considered that the pins and posts are no different from, and read on, applicant's "protrusions" which extend into "cylindrical depressions" which read on applicant's "groove".

d. Again, when it is understood that the pads and pins **are integral with the support beam** itself (column 2 lines 15-18), they are considered as being part of the support beam itself. It appears applicant is attempting to define his invention

by arguing that the pins and pads of Anthony are NOT an integral part of the support beams, however there is no novelty in manufacturing an integral support beam including said pads and pins when the art clearly teaches a support beam with separately installed pads and pins already an integral part of the beam (welded or otherwise affixed).

e. Anthony clearly sets forth the basic teaching that a nuclear core can be supported by a plurality of beams interfacing with small removable plates. Applicant's method of supporting individual plates by interfitting said plates with a metal supporting beam structure is by no means novel. Such is considered a notoriously old and well known method of supporting various mediums including drop ceilings, the two foot by four foot overhead florescent light panels, raised floors, manhole covers, cable support systems, etc. as shown in any of Bettinger, Naka et al., Platt et al., or McCall et al.

f. Anthony does indeed describe removable support plates. In fact Anthony describes removable support plates already attached to the bottom of the nuclear fuel assemblies which would appear to eliminate the separate step of having to remove said plates individually, after the fuel assemblies are removed, because said plates would be removed with each fuel assembly instead. Applicant's arguments do not negate the fact that regardless of whether applicant considers the lower end plate is part of a fuel assembly, it still performs the function of supporting the core. It is inconsequential whether the supporting mechanism is attached to the support beams or the fuel assemblies themselves. Clearly said

lower end plate is removable from said fuel assembly. It would appear that Anthony clearly discloses the instant invention by simply removing said lower end plates from the fuel assemblies and placing them directly on the support beam matrix itself, which is nothing more than a rearrangement of parts. Applicant's attempt to argue that such is not possible is untenable.

9. Claims 1-6 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,782,439 to Rinderer for the reasons set forth in section 11 of the previous office action mailed 9/1/2005.

Applicant's arguments filed 2/1/2006 have been fully considered but they are not persuasive. Although Rinderer col. 3 lines 5-9 discloses the thickness as 0.125 inches, col. 3 lines 9-10 also disclose "it is to be understood that the thickness may vary depending on the size of the hub. Clearly Rinderer would need to be tailored to be strong enough to support the weight it is intended to carry as even applicant himself states on page 9, "Applicants submit that one skilled in the art would know how thick the support plates would need to be to function in a nuclear reactor and to support the fuel assemblies."

The apparatus of Rinderer is inherently capable of use in whatever situation the owner of said apparatus decides to employ it in. Rinderer can indeed perform Applicant's intended use for supporting fuel assemblies in a reactor pressure vessel including a core because the claims language does not specifically require the apparatus to support the entire core nor all of the fuel assemblies therein.

It is noted that the claim contains statements of *intended or desired use (for supporting fuel assemblies...)*. However, there is well settled case laws that such statements as to possible future acts or to what may happen in a method or operation, are essentially method limitations or statements of intended or desired use and do not serve to patentably distinguish the claimed structure over that of the references. See *In Re Pearson*, 181 USPQ 641; *In re Yanush*, 177 USPQ 705; *In re Finsterwalder*, 168 USPQ 530; *In re Casey*, 152 USPQ 235; *In re Otto*, 136 USPQ 458; *Ex parte Masham*, 2 USPQ 2nd 1647.

See MPEP 2114 which states:

> A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ 2nd 1647.
>
> Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than functions. *In re Danly*, 120 USPQ 528, 531.
>
> Apparatus claims cover what a device is, not what a device does. *Hewlett-Packard Co. v. Bausch & Lomb Inc.*, 15 USPQ 2nd 1525, 1528

As set forth in MPEP 2115, a recitation in a claim to the material or article worked upon, does not serve to limit an apparatus claim.

Again, in response to applicant's arguments, the recitation for supporting fuel assemblies in a reactor pressure vessel including a core has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim

does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Although Rinderer appears to indicate that the rails and hubs are on the upper side of the hub, Rinderer is clearly capable of being used in either orientation by, for example, simply rotating figures 10 and 11, 180 degrees. This would NOT destroy the reference because the supports are used to provide physical support and means for securing the electrical cables (which according to Figure 1 appears to be cable ties). It appears Rinderer is capable of use in either orientation, accordingly Rinderer still reads on the claim language when it is employed in an inverted state.

10. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Bettinger.

Bettinger discloses an apparatus comprising:

a plurality of support beams (Figures 10-12, reads on item (128)); and

a plurality of support plates (130) disposed on said plurality of support beams (128), each said removable support plate (130) comprising a top surface and an opposing bottom surface and at least one groove (134) in said bottom surface, each said groove sized to engage one of said support beams where at least a portion (132) of said beam is positioned in said groove wherein it is understood that item (132) is an integral part of and at least a portion of said

beam (128) and Bettinger is inherently capable of Applicant's intended use because Bettinger can be employed for whatever intended uses its owner decides to employ it in.

Again, the recitation for supporting fuel assemblies in a reactor pressure vessel including a core has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

Regarding claim 2, in it's broadest sense, the limitation a "core" support connotes a basic, essential part, which in the case of a raised floor, is considered a basic and essential part of a room that needs a raised floor and is thus considered a core support for whatever room it is installed in. The claim language does NOT specifically disclose the metes and bounds of the limitation core support nor that it is a NUCLEAR core that it is supporting.

See MPEP 2111.01, which states

While the claims of issued patents are interpreted in light of the specification, prosecution history, prior art and other claims, this is not the mode of claim interpretation to be applied during examination. During examination, the claims **must be interpreted as broadly as their terms reasonably allow**. In re American Academy of Science Tech Center, F.3d, 2004 WL 1067528 (Fed. Cir. May 13, 2004)

Claim 3 is disclosed in, for example, Figure 1, wherein the support ring is considered those beams on the outer perimeter. Note that the limitation "support ring" does not connote any particular physically structure, per se, nor exactly what is being supported.

Claim 4 is clearly disclosed in Figure 10, wherein the support plates are removable from the top.

Claim 5 is disclosed in, for example, Figure 12 wherein it is understood that the "protrusion" reads on item (132)

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

11. Claims 1-8, 10, 11, 13 and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,813,327 to Challberg in view of U.S. Patent 3,650,895 to Sodergard and further in view of U.S. Patent 4,922,670 to Naka et al.

Challberg discloses a nuclear reactor comprising:

a reactor pressure vessel (10);

a reactor core (22) located inside said reactor pressure vessel (10);

and an apparatus (50) for supporting fuel assemblies in a reactor pressure vessel including a core, said apparatus comprising:

a plurality of support beams (60); and

a removable support plate ((58), (82)) disposed on said plurality of support beams, said removable support plate comprising a top surface and an opposing bottom surface and at least one groove in said bottom surface sized to engage one of said support beams where at least a portion of said beam is positioned in said groove wherein "at least one groove" reads on grooves in the surface of the plate created during the manufacturing and surface finishing process and statistically speaking there will be "at least a portion" of a support beam positioned in said groove due to it's surface anomalies as well. Applicant's claim langue does not prevent such an interpretation because the limitation "portion" reads on ANY portion, including scratches, deviations, specks, bumps, etc. inherent in the manufacturing process of metals and the limitation "groove" does NOT connote any particular kind, shape, size, or geometry of groove per se.

Challberg does not specifically disclose that the support plate is made up of a plurality of sub plates, however Figure 3 of Challberg appears very similar to applicants Figure 4 with regard to the support plate flow holes and support beam matrix orientation.

It is noted that applicant did not traverse the Examiners contention that it is well within the ordinary level of skill in the nuclear art to make the support plate separable. Accordingly, since applicant did not traverse the examiner's

assertion, the common knowledge or well-known in the art statement is taken to be admitted prior art because applicant failed to traverse the examiner's assertion (reproduced here below for applicant's convenience). See MPEP 2144.03(C) [R-1].

While the support plate of Challberg appears to be one integral plate, making separable is within the skill of one having ordinary skill in the art. See In re Dulberg, 289 F.2d 522, 523, 129 USPQ 348, 349 (CCPA 1961). As applied here it would appear that if it were considered to be desirable for any reason to divide the support plate into smaller pieces (i.e., ease of installation (less weight, more clearance, etc.), ease of shipping smaller pieces, etc.), it would have been obvious to make the support plate into smaller individually separable pieces/plates for that purpose.

However, in this regard, Sodergard teaches, in for example, figures 1-3, column 1 lines 9-17, 20-25, 32-45, and column 2 lines 7-10, 59-67, it is old, well known and advantageous to divide the core support plate into separate blocks (8) for the benefits of, for example, repairing guide tubes without dismantling the entire core bottom, inspection access to the lower part of the pressure vessel, etc.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to divide the core plate of Challberg into separate blocks, as taught by Sodergard, such that the grooves shown in, for example, Sodergard Figure 3, at the lower portion of the block (8), would align and therefore mate with the

protrusion (upper portion of beam (96) in Figure 5 of Challberg) of the support grid, as taught to be old and advantageous by Sodergard.

While patent drawings are not drawn to scale, relationships clearly shown in the drawings of a reference patent cannot be disregarded in determining the patentability of claims. See In re Mraz, 59 CCPA 866, 455 F.2d 1069, 173 USPQ 25 (1972).

If applicant is of the opinion that Challberg in view of Sodergard does not disclose at least one groove in the bottom surface, with each groove sized to engage one of the support beams where at least a portion of the beam is positioned in the groove, then it would have been obvious to incorporate the use of a groove to do so for at least the following reasons:

Challberg Figures 5, 6 and 10, and Sodergard Figures 5-7 ((14),(15)) show it is known in the nuclear art to utilize grooves and protrusions as a means of securing or aligning various components in their respective location.

Naka et al. discloses an apparatus comprising a plurality of support beams (13) and a plurality of support plates(14) comprising a top surface and an opposing bottom surface and at least one groove (14f) in said bottom surface sized to engage one of said support beams wherein at least a portion of said beam is positioned in said groove in, for example, Figures 3, 4, 6, 10, 11, 13, column 2 lines 49+, and column 6 lines 1-10. Naka et al. teaches that the groove engages with the panel-retaining member of the stringer for the benefits of increased rigidity, resistance to earthquakes and resistance to deformation under

load. Although Naka et al. is concerned with raised floors, applicant is claiming an apparatus that does not necessarily have to be used in a nuclear reactor to support nuclear fuel assemblies and Naka et al. discloses a supporting structure inherently capable of Applicant's intended uses. Note, it is not a matter of whether one would WANT to utilize the invention in the same manner as applicant, it is a matter of whether or not the CAPABILITY is present.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to incorporate the teachings of any of Challberg, Sodergard or Naka et al. into the design of each of the separate support blocks such that the bottom surface incorporates a groove for aligning with the support beams for the benefits of securing/aligning said support plates in agreement with the support beams as well as to increase the rigidity of the support plate matrix, as such is no more in the use of commonly known methods of joining/aligning/mating/engaging separate pieces already well known in the nuclear art, especially since applicant concedes that those skilled in the art already understand the use of protrusions and grooves and their inherent uses and benefits, in for example, page 10 second and third paragraphs.

"Patent documents are written for persons familiar with the relevant field; the patentee is not required to include in the specification information readily understood by practitioners, lest every patent be required to be written as a comprehensive tutorial and treatise for the generalist, instead of a concise statement for persons in the field." Verve LLC v. Crane Cams Inc, 65 USPQ2d 1051, 1053-1054 (Fed Cir. 2002).

It appears applicant is seeking patentability for at least the following features:

1. Taking a previously solid support plate and separating it into smaller pieces and

2. The method of aligning the pieces after they have been separated.

As previously explained Challberg shows the support beam matrix however the support plate is one integral plate, Sodergard provides motivation for dividing the plate into smaller pieces and again, the use of grooves and protrusions for aligning separate elements surrounds us, from drop ceiling tiles, to manhole covers, to raised floors, etc.

Claim 2 is disclosed in, for example, Challberg Figure 1 as modified above, wherein said plurality of removable support plates and said plurality of support beams form a core support (58).

Challberg further discloses claim 3 in, for example, Figures 1, 3, 7, 8 and 11, wherein it is clearly shown that the core plate assembly further comprises a support ring having an inner periphery and an outer periphery, said plurality of support beams extending between said inner periphery, said plurality of support beams intersecting one another to form a support beam matrix.

Claim 4 is clearly disclosed in, for example, Sodergard column 2 lines 38-43, wherein each removable support plate is removable from above the core.

Claim 5 is further disclosed in, for example, Challberg, figure 5, wherein each of said plurality of support beams (96) comprise a protrusion (reads on the

upper most tapered portion of beam (96) as well as any protruding defects on the surface) extending along a length thereof, said protrusion receivable within said at least one groove, wherein it is understood that by placing Sodergard's blocks (8) on top of Challberg's support beam matrix such that the edges of the blocks line up with said beams, the protrusion on the top of beam (96) will obviously be received within the grooves on said blocks. See for example Sodergard figures 2 and 3.

Claims 6 and 15 are further disclosed in, for example, Sodergard Figure 3, wherein said at least one removable support plate (8) comprising at least one support plate flow passage (9).

Claims 7 and 16 are further disclosed in, for example, Challberg Figure 5, wherein each removable support plate (82) comprising at least one removable support block (80) disposed thereon, said removable support block having at least one support block flow passage (88) in flow communication with one of said at least one support plate flow passage.

Claims 8 and 17 are further disclosed in, for example, Figure 5, wherein said removable support block (80) comprising at least one flow inlet portion extending from one side of said removable support block, said at least one flow inlet portion providing flow communication to one of said at least one support block flow passage, said at least one flow inlet portion receivable within one of said at least one support plate flow passage.

Claim 10 is further disclosed in, for example, Sodergard Figure 2, wherein said support plate further comprises a guide tube opening (10), said guide tube opening comprising at least one cruciform shaped slot, said support plate further comprising a first groove, a second groove, a third groove and a fourth groove, said first, second, third and fourth grooves located in a bottom surface of said support plate and positioned around said guide tube opening wherein it is understood that the grooves are considered as reading on the depression of the lower corners of the support blocks and applicant's current claim language does not define over such.

Claim 11 is also disclosed in , for example, Sodergard Figure 3 wherein at least two of said first groove, second groove, third groove and fourth groove extend along said bottom surface substantially parallel to each other, and wherein one end of at least one of said first groove, second groove, third groove and fourth groove intersects with one end of at least one of said first groove, second groove, third groove and fourth groove because the grooves appear to be present on each of the four lower circumferential edge surfaces of each support block (8).

12. Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 6,813,327 to Challberg in view of U.S. Patent 3,650,895 to Sodergard and further in view of U.S. Patent 4,922,670 to Naka et al. as applied to claims 1-8, 10, 11, 13 and 15-18 above and further in view of U.S. Patent 5,519,746 to Dalke et al.

Challberg as modified above discloses applicant's invention as explained above, however Challberg as modified does not specifically disclose that at least one internal flow passage directs flow into a first channel and a second channel, said first and second channels located within said at least one removable support block and that said first channel has a first flow outlet and said second channel has a second flow outlet.

Dalke teaches it is old and advantageous to increase the size of BWR fuel bundles by utilizing a bundle support plate (140) (See, for example, Figures 1-10) comprising at least one internal flow passage directing flow into a first and second channel having first and second flow outlets (54), for the benefits of reducing the total number of control rod drive mechanisms and to reduce the amount of fuel handling and shuffling during refueling outages in, for example, column 1 lines 60+. Dalke also teaches that it is simpler to provide four (sub bundle/fuel assembly) inlet nozzles in the inter-bundle support plate and that each sub-bundle can be separately orificed in order to assure good thermal-hydraulic-nuclear stability in, for example, column 2 lines 47-51.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to incorporate the inter-bundle support plate of Dalke in the core support design of Challberg as modified by Sodergard for the benefits therein, as taught to be old and advantageous by Dalke. (See also, for example, Dalke, Column 3, lines 5-15)

Note, Dalke also teaches the use of protrusions (65) and grooves (86) for the alignment of elements in, for example, figures 3-6 and column 5 lines 1-17.

Response to Arguments

13. Applicant's arguments, see the remarks, filed 2/1/2006, with respect to sections 12 (amended claims to include a plurality), 14 and 15 of the Office action mailed 9/1/2005 have been fully considered and are persuasive. Accordingly the rejections of sections 12, 14 and 15 of said previous office action have been withdrawn.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- McCall et al. (fig 2.) and Platt et al. (fig. 6) teach apparatus with support beams and support plates with grooves in the bottom surface.
- Sidney, Steinkamp, Braun, Thorp, Small and Medium Power Reactors and Annex 3 all teach it is notoriously old and well known in the nuclear art to use support grids/pillars/columns/contoured I-beams, etc. for core support structures.
- Anderson teaches it is old and well known to for the lower support plate to utilize individual plates.
- Hirukawa, Hosoya and Carruth also teach applicants inventive concept applied in a different fashion.

16. Examiner's Note: Examiner has cited particular columns and line numbers in the references as applied to the claims for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant, in preparing the responses, to fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel L. Greene Jr. whose telephone number is (571) 272-6876. The examiner can normally be reached on Mon-Fri 8:30am - 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jack Keith can be reached on (571) 272-6878. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

18. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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2006-04-25

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